

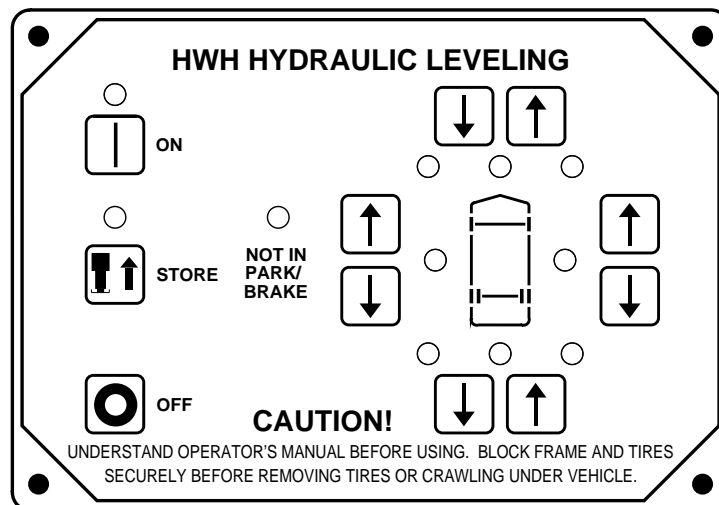


OPERATOR'S MANUAL

HWH TOUCH PANEL-CONTROLLED 310 SERIES LEVELING SYSTEM

FEATURING:

*Touch Panel Control
Hydraulic Leveling
Straight-Acting Jacks*



HWH CORPORATION

(On I-80, Exit 267 South)

2096 Moscow Road | Moscow, Iowa 52760

Ph: 800/321-3494 (or) 563/724-3396 | Fax: 563/724-3408

www.hwh.com

AP10043 - U.S.
AP10301 - Europe

ML10043/MP05.3005/LH-S
28AUG02

OPERATOR'S MANUAL

CAUTION !

READ THE ENTIRE OPERATOR'S MANUAL BEFORE OPERATING.

BLOCK FRAME AND TIRES SECURELY BEFORE CRAWLING UNDER VEHICLE. DO NOT USE LEVELING JACKS OR AIR SUSPENSION TO SUPPORT VEHICLE WHILE UNDER VEHICLE OR CHANGING TIRES. VEHICLE MAY DROP AND/OR MOVE FORWARD OR BACKWARD WITHOUT WARNING CAUSING INJURY OR DEATH.

KEEP ALL PEOPLE CLEAR OF VEHICLE WHILE LEVELING SYSTEM AND ROOM EXTENSION ARE BEING OPERATED.

NEVER PLACE HANDS OR OTHER PARTS OF THE BODY NEAR HYDRAULIC LEAKS. OIL MAY PENETRATE SKIN CAUSING INJURY OR DEATH.

WEAR SAFETY GLASSES WHEN INSPECTING OR SERVICING THE SYSTEM TO PROTECT EYES FROM DIRT, METAL CHIPS, OIL LEAKS, ETC. FOLLOW ALL OTHER APPLICABLE SHOP SAFETY PRACTICES.

IMPORTANT: IF COACH IS EQUIPPED WITH A ROOM EXTENSION, READ ROOM EXTENSION SECTION BEFORE OPERATING LEVELING SYSTEM.

HOW TO OBTAIN WARRANTY SERVICE

THIS IS NOT TO BE INTERPRETED AS A STATEMENT OF WARRANTY

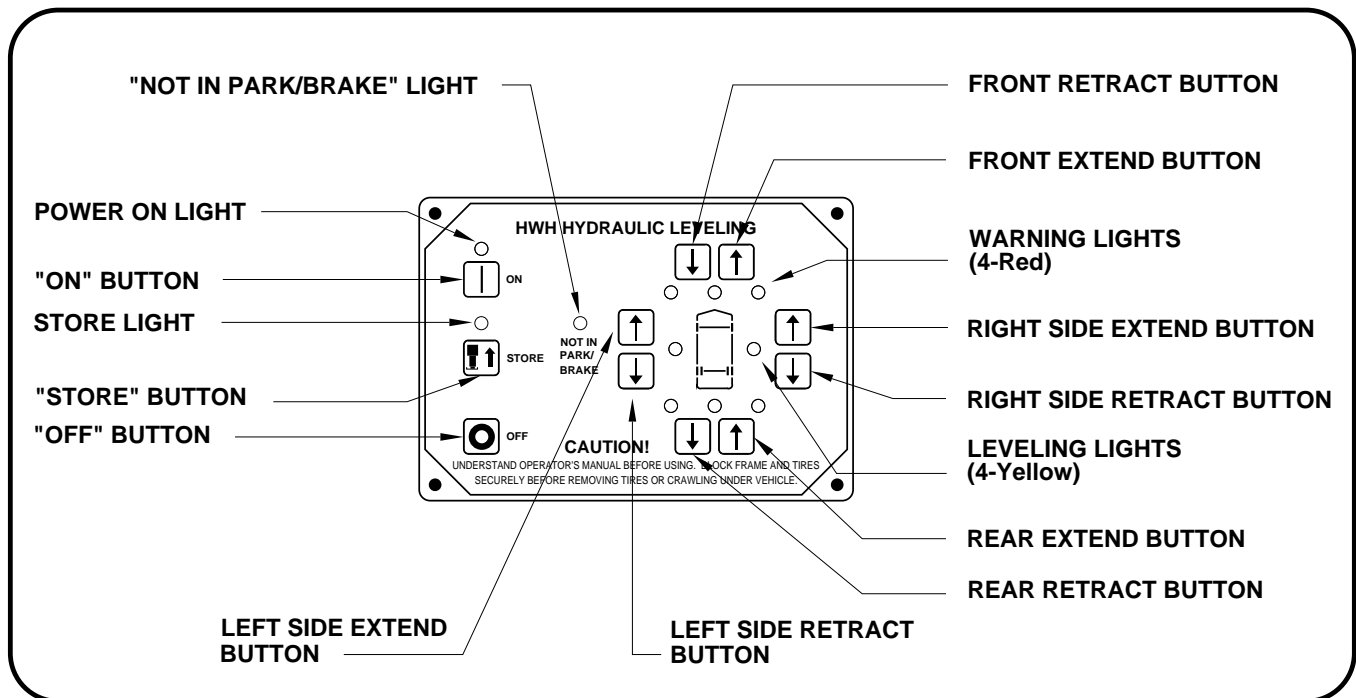
HWH CORPORATION strives to maintain the highest level of customer satisfaction. Therefore, if you discover a defect or problem, please do the following:

FIRST: Notify the dealership where you purchased the vehicle or had the leveling system installed. Dealership management people are in the best position to resolve the problem quickly. If the dealer has difficulty solving the problem, he should immediately contact the Customer Service Department, at HWH CORPORATION.

SECOND: If your dealer cannot or will not solve the problem, notify the Customer Service Department:
HWH CORPORATION 2096 Moscow Rd. Moscow IA. 52760
(563) 724-3396 OR (800) 321-3494. Give your name and address, coach manufacturer and model year, date the coach was purchased, or the date of system installation,

description of the problem, and where you can be reached during business hours (8:00 a.m. till 5:00 p.m. c.s.t.). HWH CORPORATION personnel will contact you to determine whether or not your claim is valid. If it is, HWH CORPORATION will authorize repair or replacement of the defective part, either by appointment at the factory or by the authorization of an independent service facility, to be determined by HWH CORPORATION. All warranty repairs must be performed by an independent service facility authorized by HWH CORPORATION, or at the HWH CORPORATION factory, unless prior written approval has been obtained from proper HWH CORPORATION personnel.

CONTROL IDENTIFICATION



CONTROL FUNCTIONS

CONTROL BUTTONS

"ON" BUTTON : This is the "ON" button for the leveling system. It provides control power to operate the electrical relay on the pump, the LEVELING lights and the 4 red WARNING lights.

"OFF" BUTTON : This button turns off control power to the leveling system.

"STORE" BUTTON : This button will retract all four jacks at the same time.

EXTEND BUTTONS (UP ARROWS) : These buttons will extend their respective jack pairs to lift the vehicle.

RETRACT BUTTONS (DOWN ARROWS) : These buttons will retract their respective jack pairs to lower the vehicle.

INDICATOR LIGHTS

POWER ON LIGHT: This light indicates the system is on.

STORE LIGHT: This light will be on when the system is in the store mode.

"NOT IN PARK/BRAKE" LIGHT: This indicator light is on when the panel is on, but the hand/auto park brake is not set.

LEVELING LIGHTS: If a yellow LEVELING light is on, that indicates a side, corner, or end of the vehicle is low. Extend the appropriate jack pairs to put out the yellow light. Only one yellow LEVELING light can be on at a time. The vehicle is level when all yellow lights are out.

WARNING LIGHTS: A red WARNING light will be on whenever the corresponding jack is extended approximately 1 to 2 inches, provided the ignition is in the "ACC" or "ON" position and the system is on. Some vehicles are equipped with a dash mounted master "JACKS DOWN" light which will be on when one or more jacks are extended approximately 1 to 2 inches.

WARNING BUZZER: A buzzer will sound if a jack is extended 1 to 2 inches or more and the ignition switch is in the "ON" position.

OPERATING PROCEDURES

SITE SELECTION

Park with the front of the vehicle facing downhill if possible. Care must be taken not to raise the rear of the vehicle too high or the vehicle may roll forward or backward off the

jacks. If parking on soft ground or asphalt paving, wood blocks or pads should be placed under the jacks.

ROOM EXTENSION PROCEDURES

IMPORTANT: If the vehicle is equipped with a room extension read this section carefully.

Refer to the vehicle owner's manual for proper operation of room extensions.

If the vehicle is equipped with kick down jacks, the wheels **MUST** be blocked securely. It is recommended the vehicle is leveled and stabilized before operating any room extension. It is recommended any room extension is retracted before retracting the leveling system. It is not recommended to operate the leveling system when any room extension is extended.

IMPORTANT: Do not use a room extension support when the vehicle is supported by the leveling system.

LEVELING PROCEDURE

1. Place gear selector in the parking position, apply park brake and block tires securely.

NOTE: If the hand/auto park brake is not set, the "NOT IN PARK/BRAKE" light will come on when the "ON" button is pushed. The panel will turn on, but the system will not operate.

2. Place the ignition switch in the "ACC." position.

3. Push the "ON" button on the touch panel. The POWER ON light will be lit. Place pads under the jacks, if necessary, at this time.

4. A lit yellow LEVEL light indicates that the end, side, or corner is low. If a yellow light is lit, push the EXTEND (up arrow) button for that yellow light to extend the appropriate pair of jacks. Continue pushing the button until the yellow light goes out. ALWAYS LEVEL THE VEHICLE FROM SIDE TO SIDE, IF NEEDED, BEFORE LEVELING THE VEHICLE FROM FRONT TO REAR.

Only one yellow LEVEL light can be on at one time. If a side yellow light is on, a front or rear yellow light cannot come on. Extend jack pairs accordingly until all yellow lights are out. It may take several movements from side to front or side to rear to raise a low corner. If the ground is too uneven, the jack may not have enough stroke to level the vehicle. The vehicle may have to be moved.

5. After the vehicle is level, the jacks not used for leveling may be extended until they are firmly on the ground. This provides additional stability against wind and activity in the vehicle. Do this by pushing the front and/or rear EXTEND buttons as needed to extend any remaining jacks. Jacks extended to stabilize the vehicle should lift the vehicle at least 3/4 inch. Do not use the right or left EXTEND buttons.

6. Push the "OFF" button on the touch panel.

7. Turn the ignition switch off.

NOTE: The leveling system should be cycled once a month or whenever the vehicle is used, to keep the system in operating condition.

OPERATING PROCEDURES

RETRACT PROCEDURES

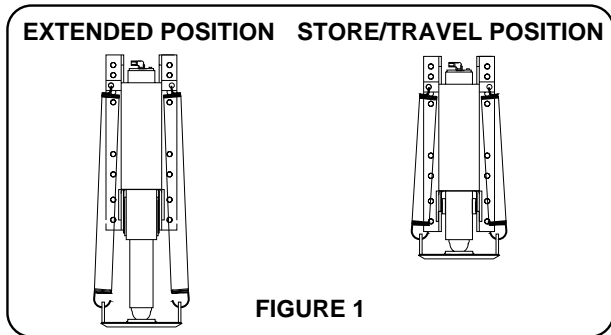


FIGURE 1

CAUTION: THE OPERATOR MUST BE SURE THAT THERE ARE NO OBJECTS UNDER THE VEHICLE AND THAT ALL PEOPLE ARE CLEAR OF THE VEHICLE.

1. Turn the ignition switch "ON" and press the "ON" button one time. The ON indicator light will glow steady.

NOTE: The park brake does not have to be set to put the system in the "STORE" mode.

2. Press the "STORE" button. As each jack retracts, its red WARNING light will go out. The vehicle can be moved as soon as the red WARNING lights are out, provided the jacks are in the STORE/TRAVEL position. (See FIGURE 1)

IMPORTANT: DO NOT interrupt power to the leveling system while it is in the STORE mode. DO NOT push the "OFF" button or turn the ignition key. The system must be allowed to completely finish the STORE mode. If the engine was started before putting the system in the STORE mode, the vehicle may be moved when the jacks are in the "STORE" position. This will not interrupt the store procedure.

CAUTION: DO NOT MOVE THE VEHICLE WHILE THE LEVELING JACKS ARE STILL IN CONTACT WITH THE GROUND OR IN THE EXTEND POSITION. THIS VEHICLE IS EQUIPPED WITH STRAIGHT ACTING JACKS. MOVING THE VEHICLE WITH THE LEVELING JACKS EXTENDED CAN CAUSE SEVERE DAMAGE TO THE JACKS AND OR THE VEHICLE AND CREATE A DRIVING HAZARD. DO NOT RELY SOLELY UPON WARNING LIGHTS. IT IS THE OPERATOR'S RESPONSIBILITY TO CHECK THAT ALL JACKS ARE FULLY RETRACTED INTO THE STORE/TRAVEL POSITION.

3. The system will automatically shut down approximately two minutes after the four individual red WARNING lights are out.

IMPORTANT: If any one red WARNING light does not go out the system will continue to store. Push the "OFF" button and have the system serviced.

4. Turn the ignition switch to the "OFF" position or proceed to travel.

NOTE: If jacks cannot be retracted by the above procedure see MANUAL JACK RETRACTION Section.

NOTE: If the vehicle is parked or stored with the jacks extended for an extended period of time and the jacks fail to retract completely, extend the jacks back down to the ground then retract the jacks again.

OPERATING PROCEDURES

MANUAL JACK RETRACTION

NOTE: Some assemblies have 4 large valves, some have 4 small valves and some will have 2 large valves in the outer positions and 2 small valves in the center positions.

CAUTION: KEEP AWAY FROM THE WHEELS, DO NOT CRAWL UNDER THE VEHICLE, KEEP A SAFE DISTANCE IN FRONT AND REAR OF THE VEHICLE. THE VEHICLE MAY DROP AND/OR MOVE FORWARD OR BACKWARD WITHOUT WARNING AS THE VALVE RELEASE IS OPERATED.

1. Locate the manual valve release on each solenoid valve. The solenoid valves are located on the power unit/valve assembly.

2. Allow clearance for the vehicle to lower.

IMPORTANT: Only open the valves enough to retract the jacks. DO NOT turn valve release nuts more than 4 and 1/2 turns. Turning the nuts more could damage the valves.

Valve release T-Handles will turn several turns easily. As the valve starts to open, the T-Handles will turn harder. Make sure the valves have been opened far enough to allow the jacks to retract.

3. Retract the front jacks by opening the two center valves. Slowly turn the manual valve releases counter clockwise until the jacks start to retract.

4. Repeat the process for the rear jacks by opening the two outer valves.

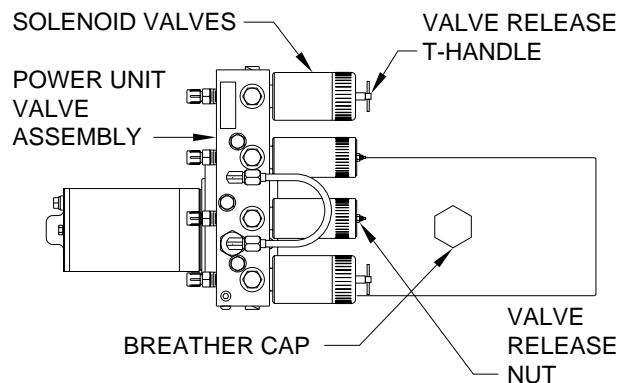
NOTE: Prior to APRIL 2002 a 1/4" Nut Driver was sent with the Operators Manual. As of APRIL 2002 the 1/4" Nut Driver has been incorporated into the Breather Cap. See the back page of this manual for further info.

5. Check that all four jacks are now retracted.

6. Close the valves by turning the manual valve releases clockwise.

IMPORTANT: Once the manual valve release is snug, DO NOT tighten the manual valve release past this point as internal damage may occur to the solenoid.

7. The system should now be repaired before using again.



MAINTENANCE

OIL LEVEL

All maintenance should be done as part of the normal servicing of the coach.

The oil level should be checked when the vehicle is first purchased and then once every two years. More often if there is an oil leak in the system.

All four jacks should be completely retracted before checking the oil level. The oil reservoir is part of the pump/manifold assembly. The oil level is checked and filled through the breather cap. Clear any dirt away from the breather/filler cap before removing. The oil level should be within one inch of the top of the reservoir. Most breather caps have a dipstick.

NOTE: Overfilling the tank can cause leakage of oil through the breather cap.

FLUID: HWH Specialty Hydraulic Oil is recommended. In an emergency Dexron automatic transmission fluid can be used. **NOTE:** Dexron automatic transmission fluid contains red dye and can cause staining should a leak occur. **DO NOT USE** brake fluid or hydraulic jack fluid. Use of these can damage seals.

ELECTRICAL SYSTEM

The batteries should be in good condition and fully charged. Weak batteries can cause erratic operation. Battery cable terminals and battery posts and connections should be kept clean.

All electrical connections, especially ground connections, should be clean, tight, free from corrosion and protected from weathering.

LEVELING JACKS

There are very few user serviceable parts on the leveling jacks. The jacks require very little maintenance. If the jacks are extremely dirty with caked on mud they should be washed.

The jack rods should NOT be wiped and do not need to be oiled or sprayed with anything. See maintenance, SYSTEM ADJUSTMENT.

VISUAL INSPECTION

Periodically inspect the leveling system for oil leaks and damaged or missing parts, such as pivot bolts or springs. Check the hydraulic lines and wiring for damage and wear. Check that the jacks do not interfere with any parts of the vehicle when they are in the "STORE" position.

The jacks should be cycled at least once a month or whenever the coach is serviced. The system will operate better if kept clean and free from caked on mud or ice.

OPERATIONAL CHECK

Review the OPERATOR MANUAL. Run the system according to the SYSTEM OPERATION (LEVELING) Section. Note any abnormal operation.

Check that all lights work according to the "INDICATOR LIGHT" Section. Correct function of the red "WARNING" light is important.

Review the "JACK RETRACTION" Section. Make sure the jacks will fully retract to the "STORE" position. Jacks should not interfere with any of the coach when in the "STORE" position.

MAINTENANCE

NOT IN PARK/BRAKE CHECK

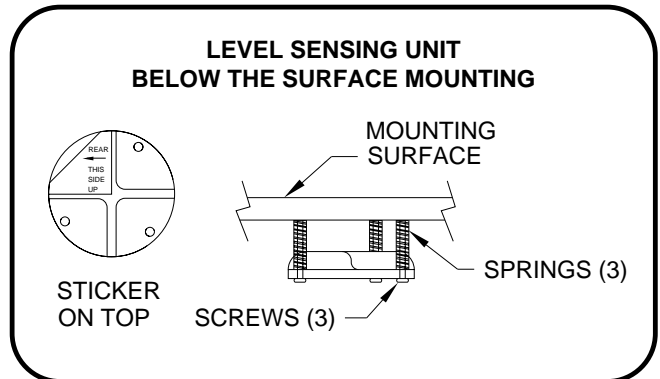
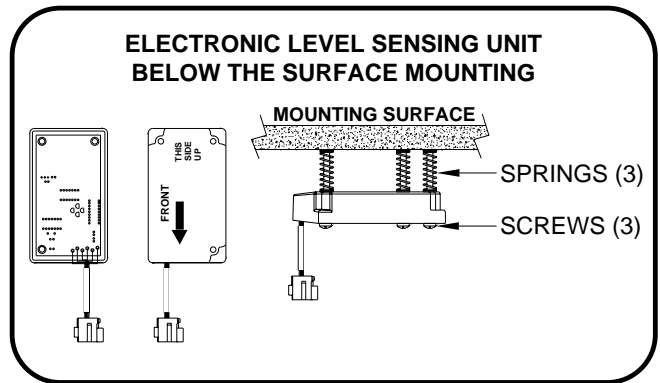
CAUTION: WHEN MAKING THIS CHECK, BLOCK THE COACH WHEELS SECURELY SO THE COACH CANNOT ROLL FORWARD OR BACKWARD.

Set the park/brake. Switch the ignition to the "ACC" or "ON" position. Push the "ON/OFF" switch toward "ON". Release the parking brake and confirm that the "PARK" indicator light comes on. Reset the parking brake. The "PARK" indicator light should go out. Switch the ignition to "OFF".

If any of the above checks or inspections reveal a problem or if there are other problems or questions, consult a qualified RV repair center, your vehicle or coach manufacturer, or HWH CORPORATION for service or repair.

LEVEL SENSING UNIT ADJUSTMENT

Level the vehicle by placing a circular bubble level in the center of the freezer floor or location within the vehicle that is to be level. With the vehicle level, adjust the sensing unit until all yellow lights are off. This is done by drawing up the corresponding screw if the sensing unit is mounted below the surface as shown or backing out the corresponding screw if the sensing unit is mounted above the surface. Bump the sensing unit to see that it is settled tight against all three screw heads and still indicates that the unit is level.

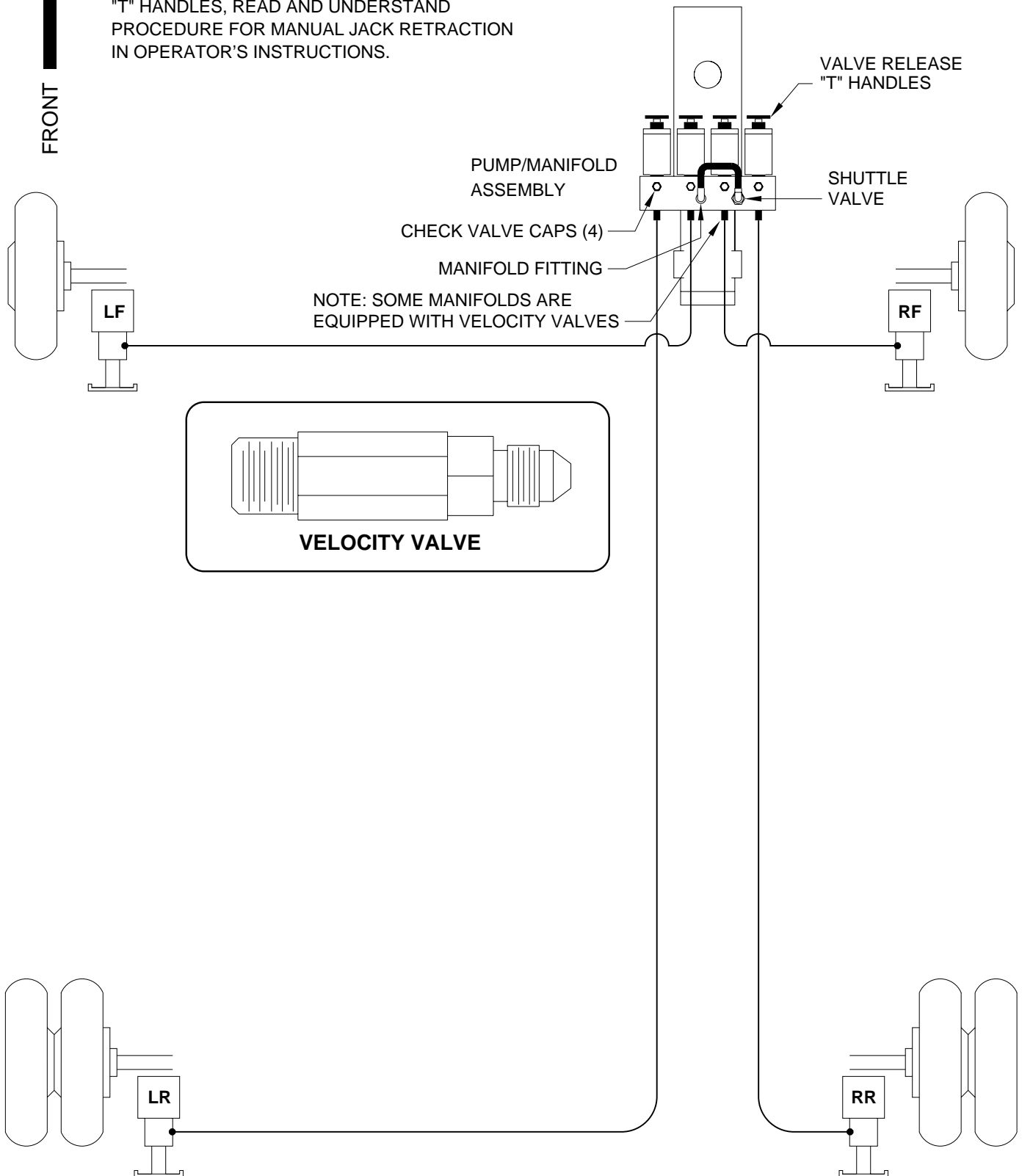


HYDRAULIC LINE CONNECTION DIAGRAM LEVELING SYSTEM

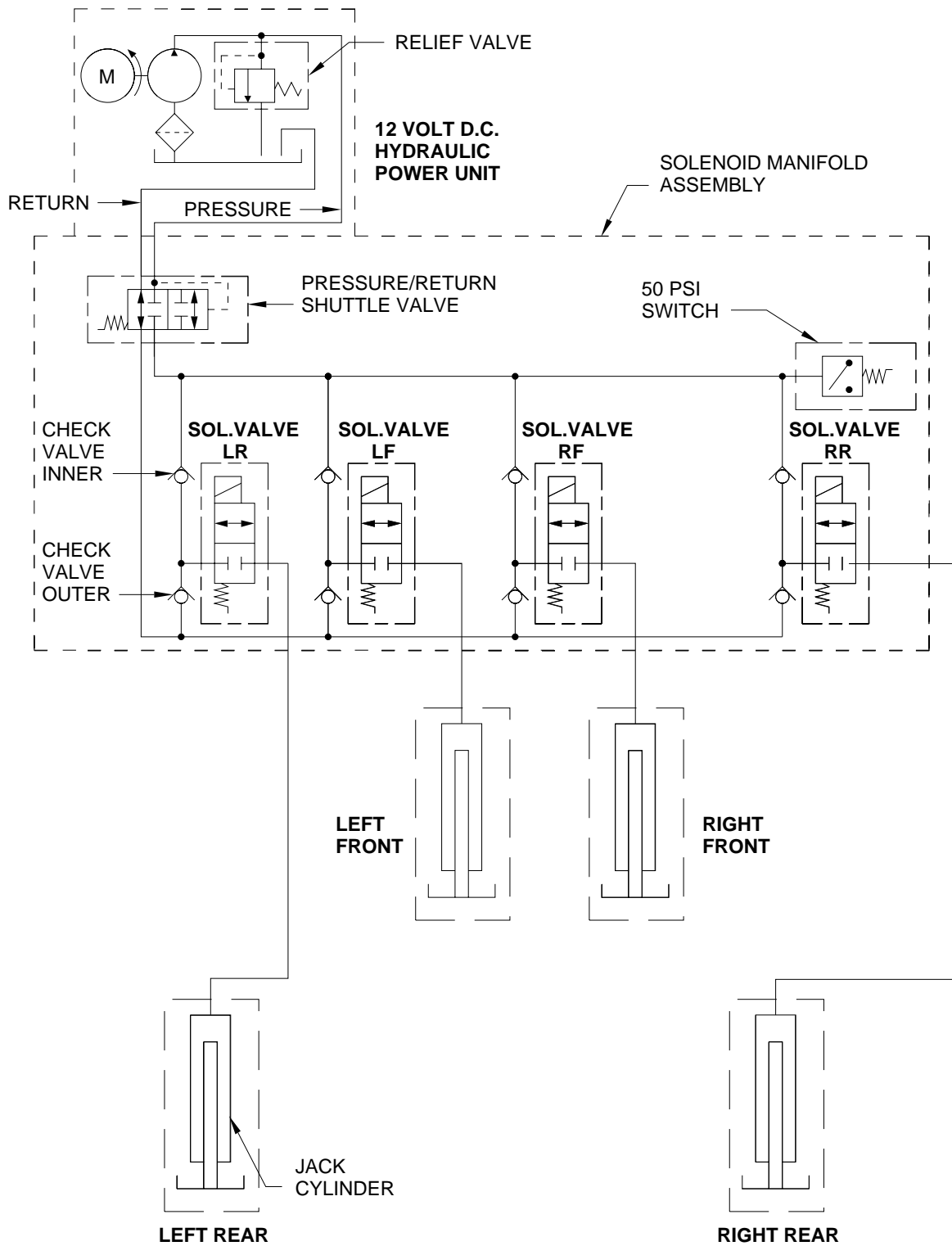


FRONT

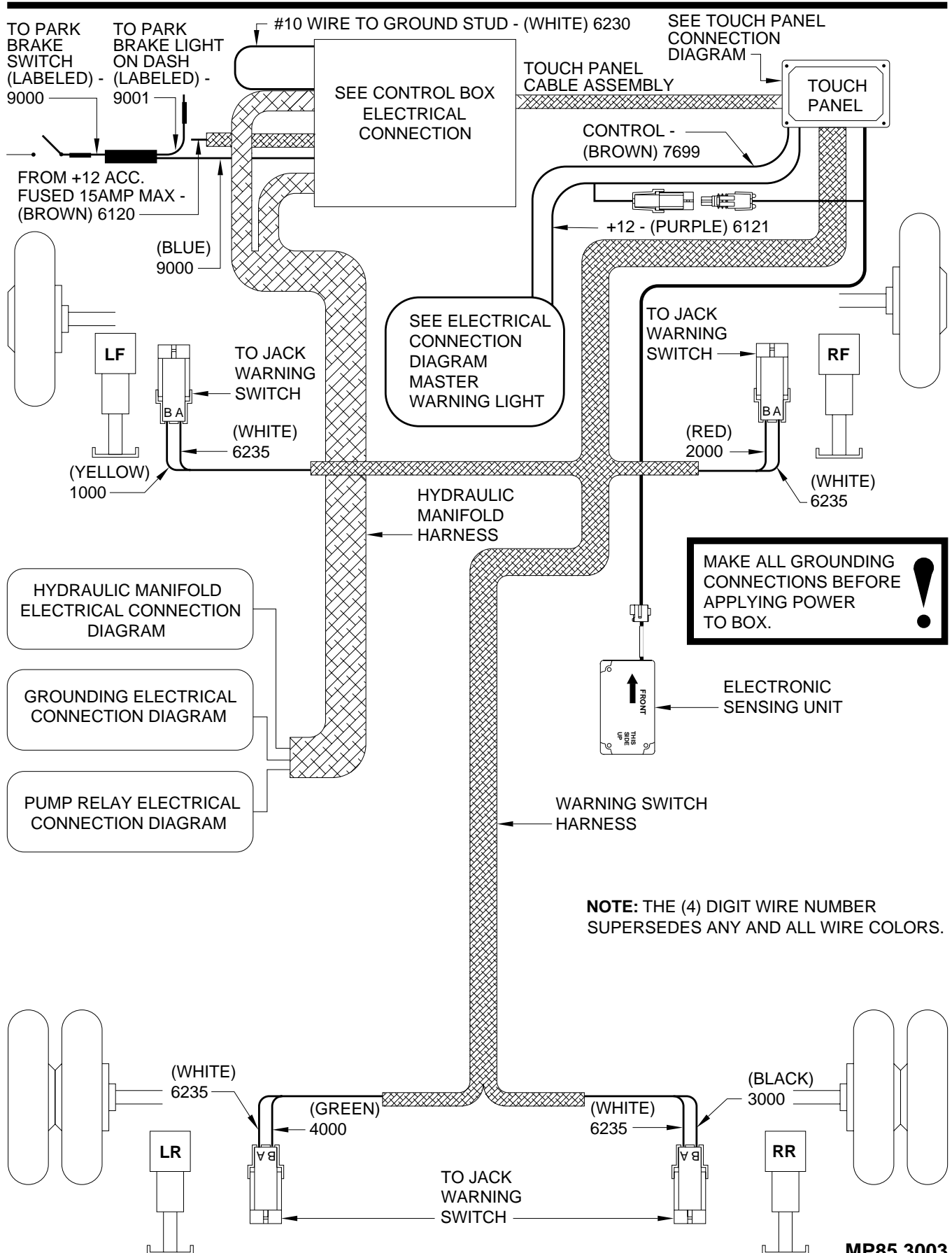
NOTE: BEFORE OPERATING VALVE RELEASE "T" HANDLES, READ AND UNDERSTAND PROCEDURE FOR MANUAL JACK RETRACTION IN OPERATOR'S INSTRUCTIONS.



HYDRAULIC SCHEMATIC
305/310/325 SERIES LEVELING SYSTEM
WITH STRAIGHT-ACTING JACKS

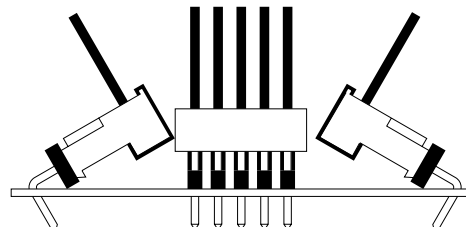
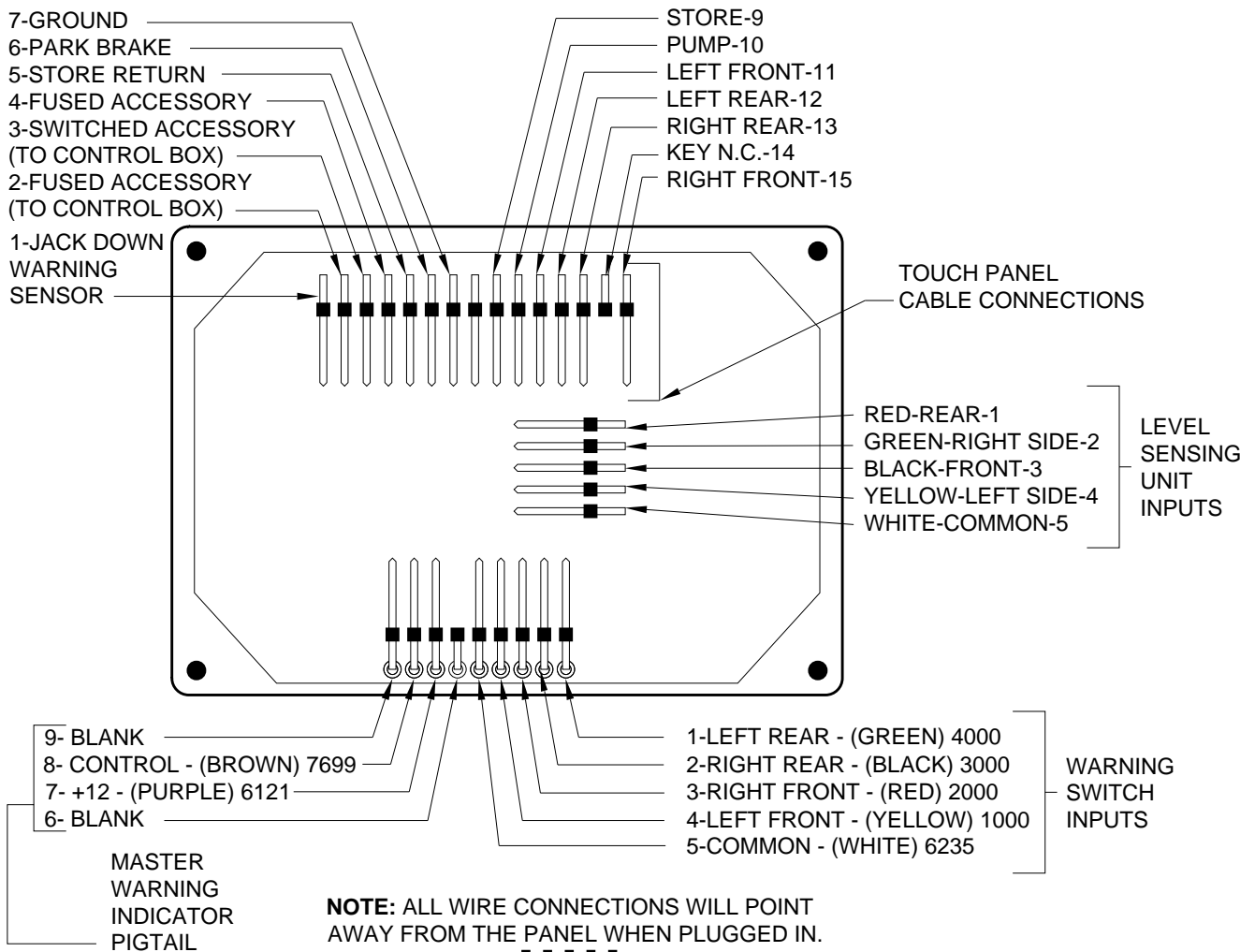
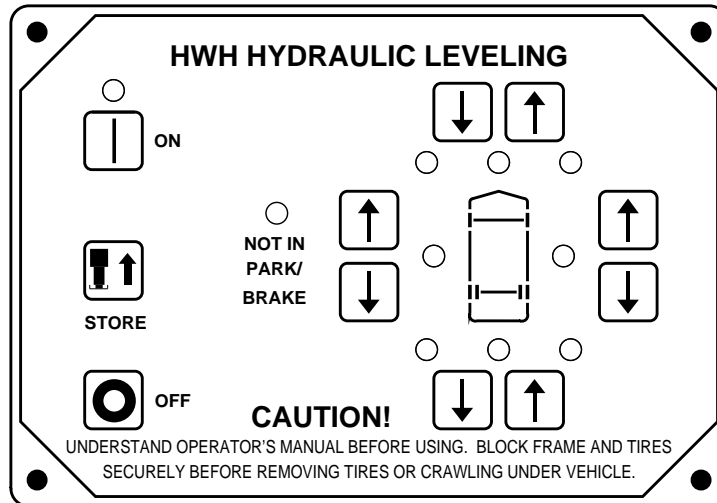


310 LEVELING SYSTEM ELECTRICAL CONNECTION DIAGRAM



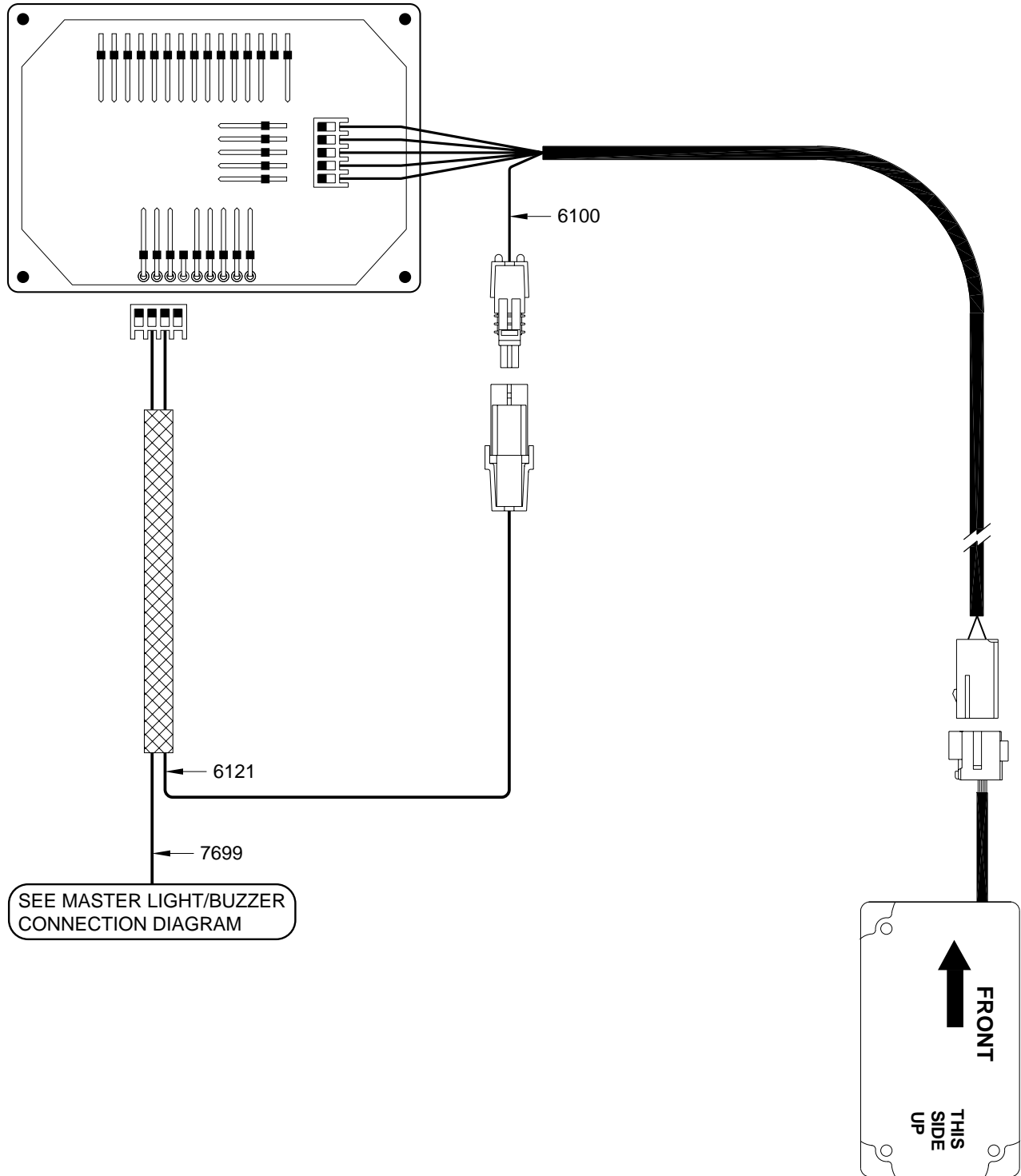
CONNECTION DIAGRAM

310/325 SERIES LEVELING SYSTEM TOUCH PANEL



NOTE: THE (4) DIGIT WIRE NUMBER SUPERSEDES ANY AND ALL WIRE COLORS.

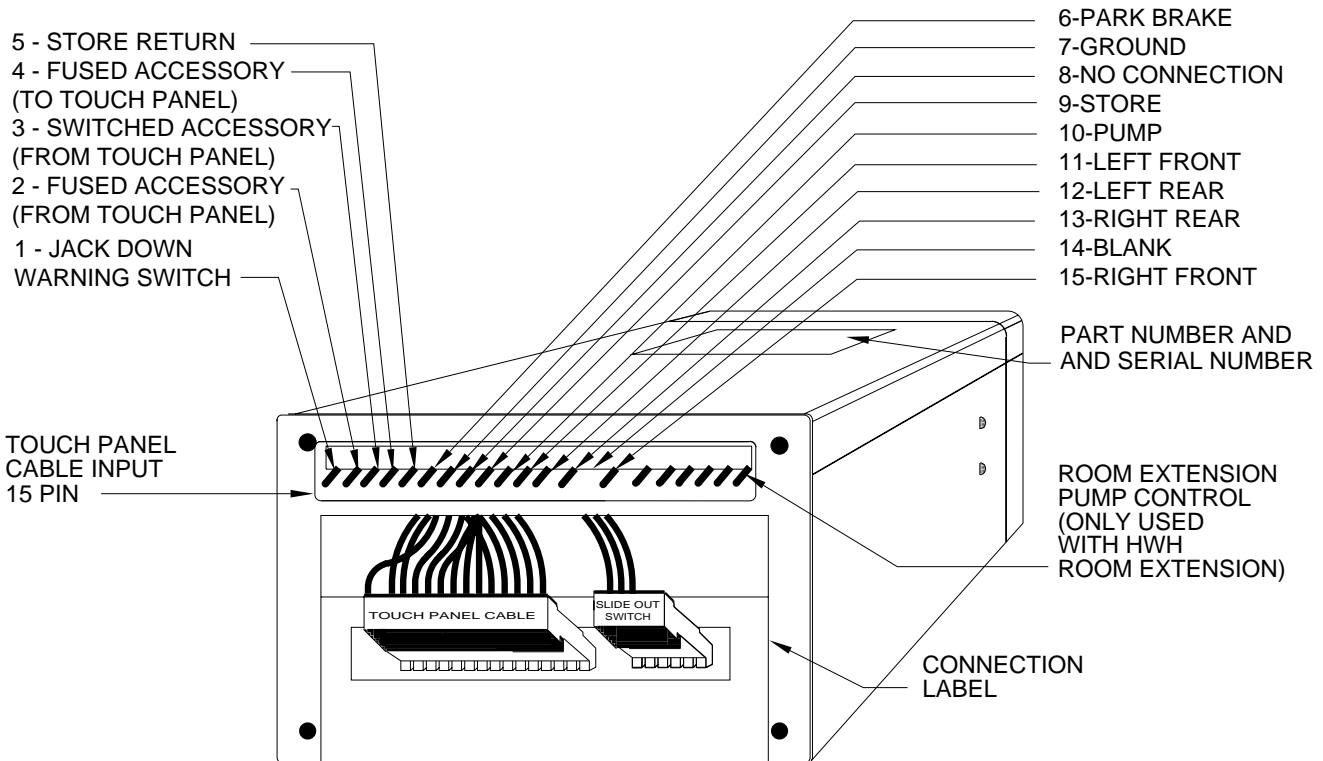
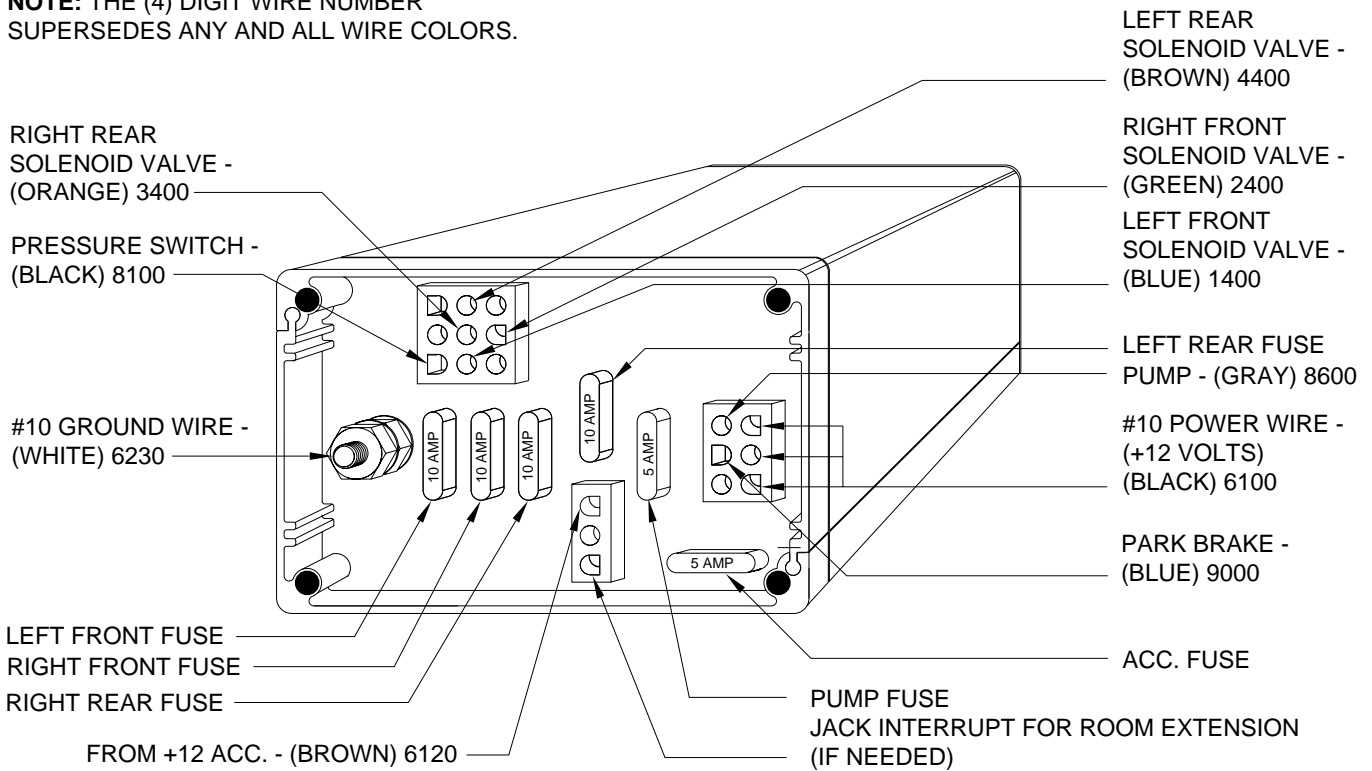
CONNECTION DIAGRAM
310/325 SERIES LEVELING SYSTEM
ELECTRICAL SENSING UNIT



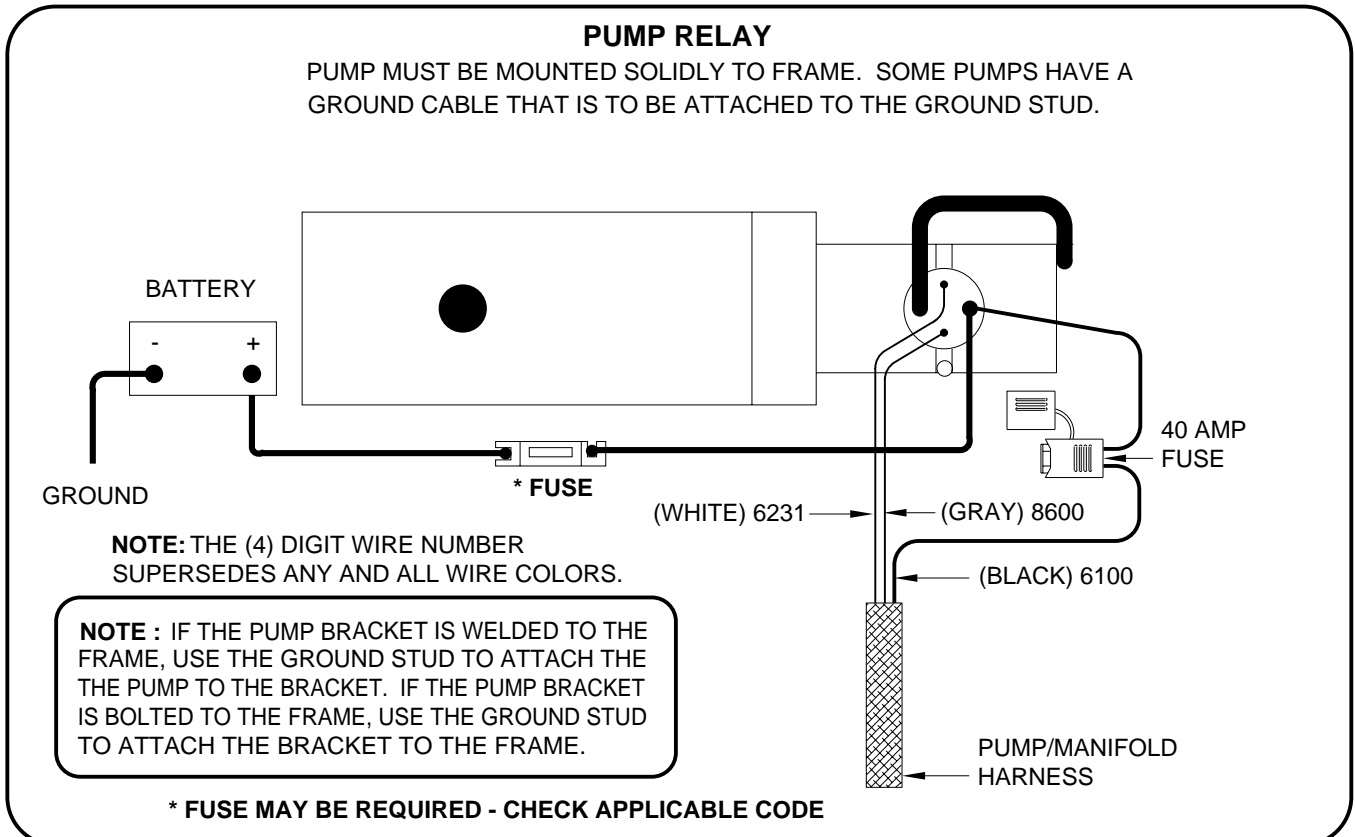
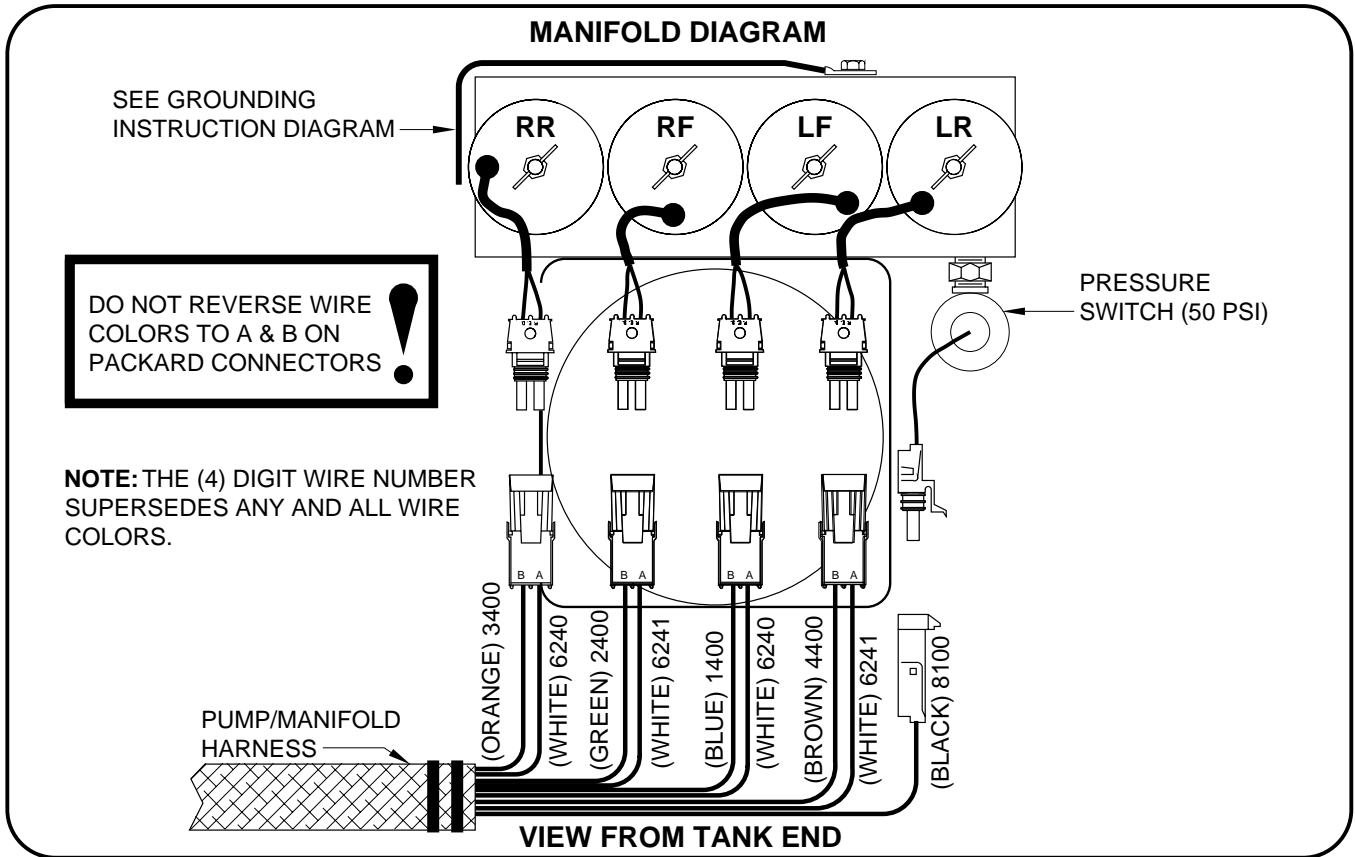
SEE MASTER LIGHT/BUZZER
CONNECTION DIAGRAM

ELECTRICAL CONNECTION DIAGRAM CONTROL BOX 310/325 SERIES LEVELING SYSTEM

NOTE: THE (4) DIGIT WIRE NUMBER SUPERSEDES ANY AND ALL WIRE COLORS.



310 LEVELING SYSTEM HYDRAULIC MANIFOLD-PUMP RELAY ELECTRICAL CONNECTION DIAGRAM



ELECTRICAL CONNECTION DIAGRAM

310/325 LEVELING SYSTEM POWER UNIT/HARNESS

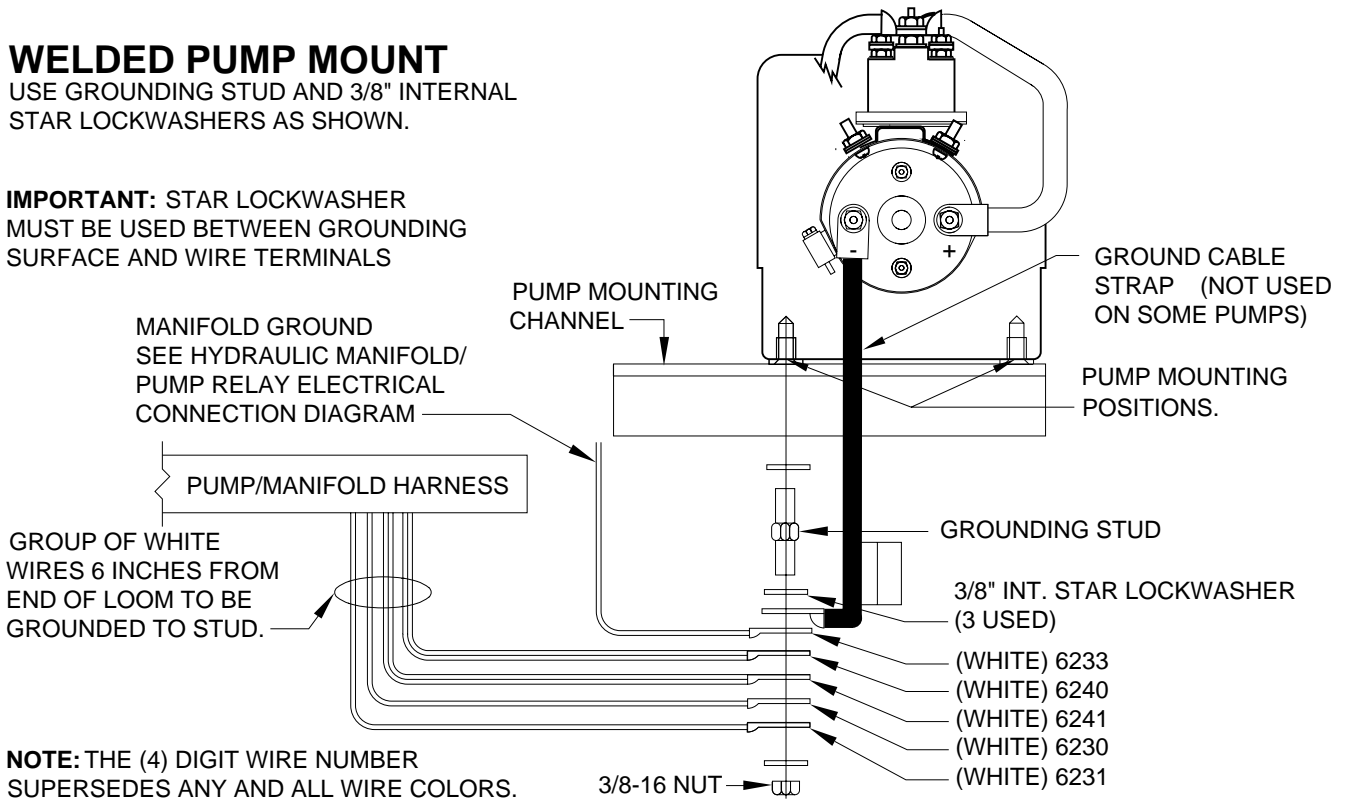
GROUNDING INSTRUCTIONS

WELDED PUMP MOUNT

USE GROUNDING STUD AND 3/8" INTERNAL STAR LOCKWASHERS AS SHOWN.

IMPORTANT: STAR LOCKWASHER MUST BE USED BETWEEN GROUNDING SURFACE AND WIRE TERMINALS

MANIFOLD GROUND
SEE HYDRAULIC MANIFOLD/
PUMP RELAY ELECTRICAL
CONNECTION DIAGRAM



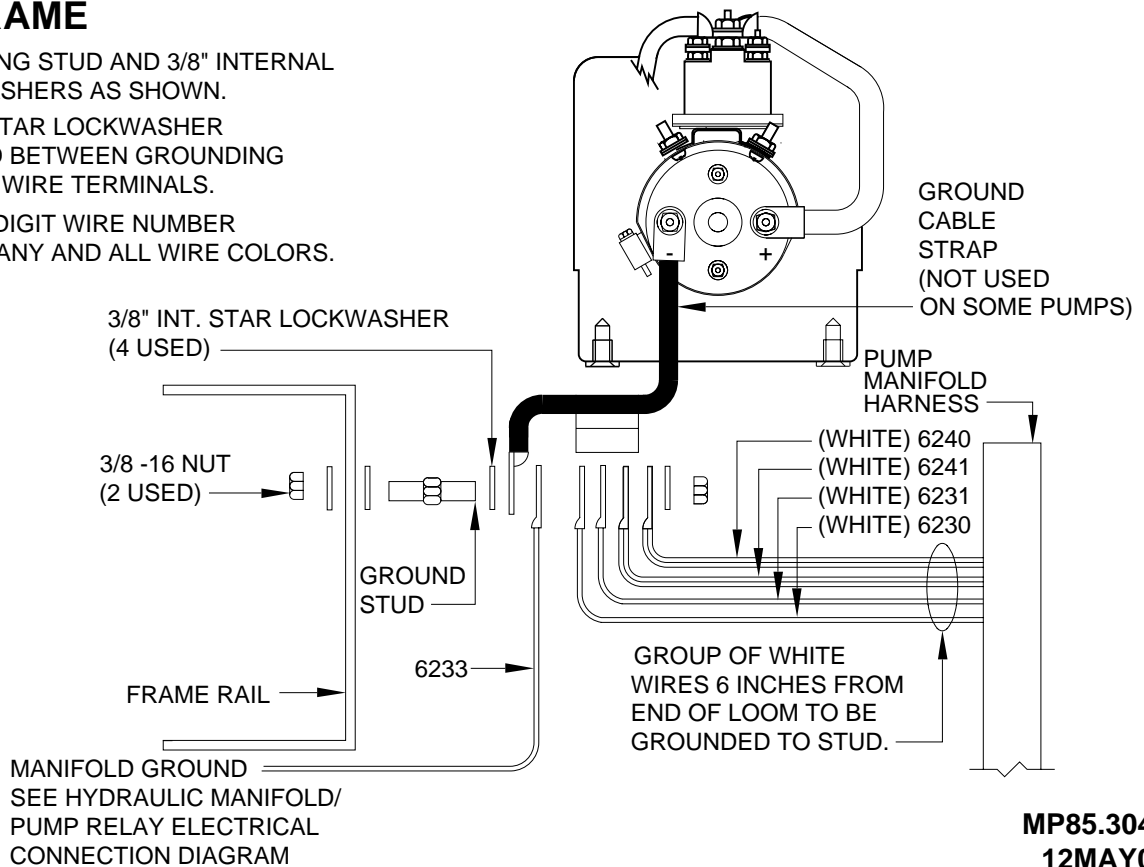
NOTE: THE (4) DIGIT WIRE NUMBER SUPERSEDES ANY AND ALL WIRE COLORS.

PUMP MOUNTED REMOTE FROM FRAME

USE GROUNDING STUD AND 3/8" INTERNAL STAR LOCKWASHERS AS SHOWN.

IMPORTANT: STAR LOCKWASHER MUST BE USED BETWEEN GROUNDING SURFACE AND WIRE TERMINALS.

NOTE: THE (4) DIGIT WIRE NUMBER SUPERSEDES ANY AND ALL WIRE COLORS.



MASTER LIGHT/BUZZER CONNECTION DIAGRAM

MANUAL LEVELING SYSTEMS

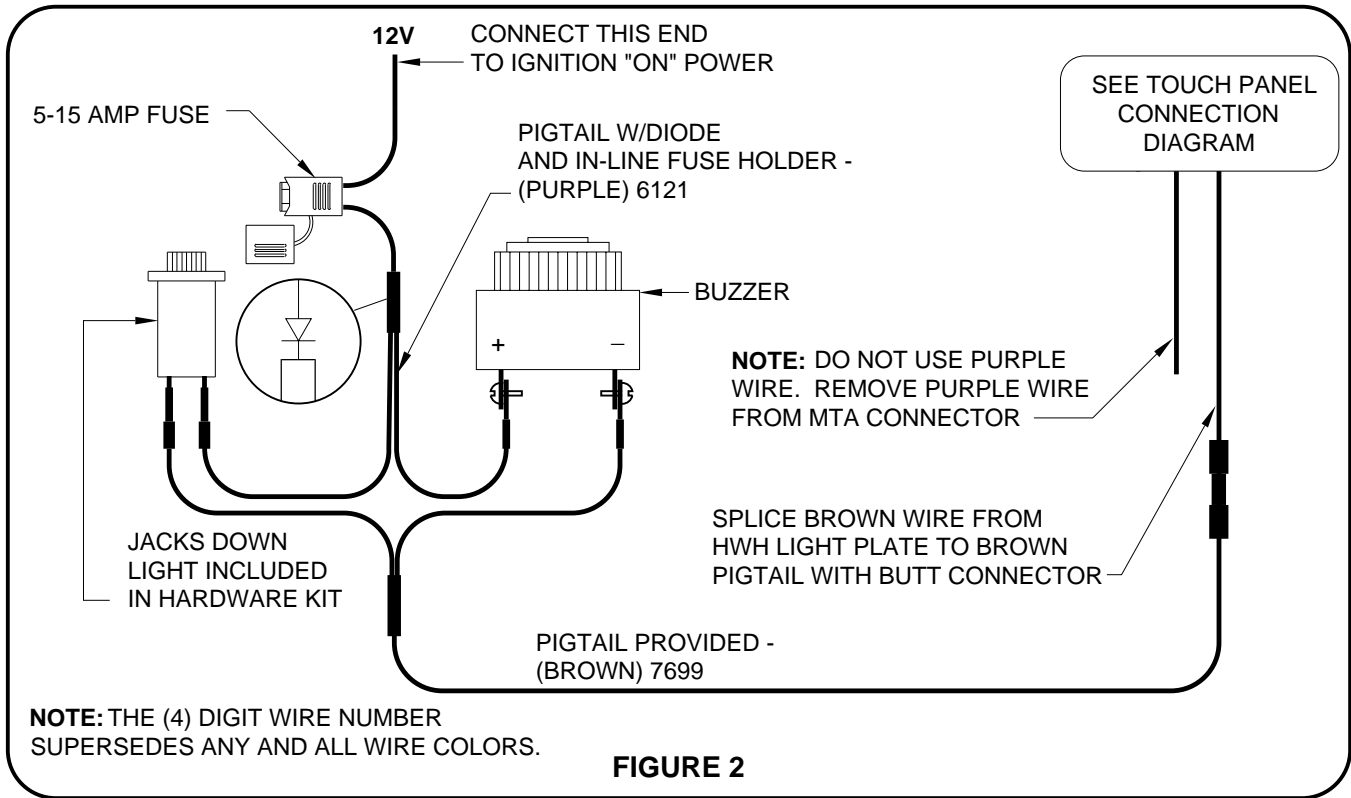
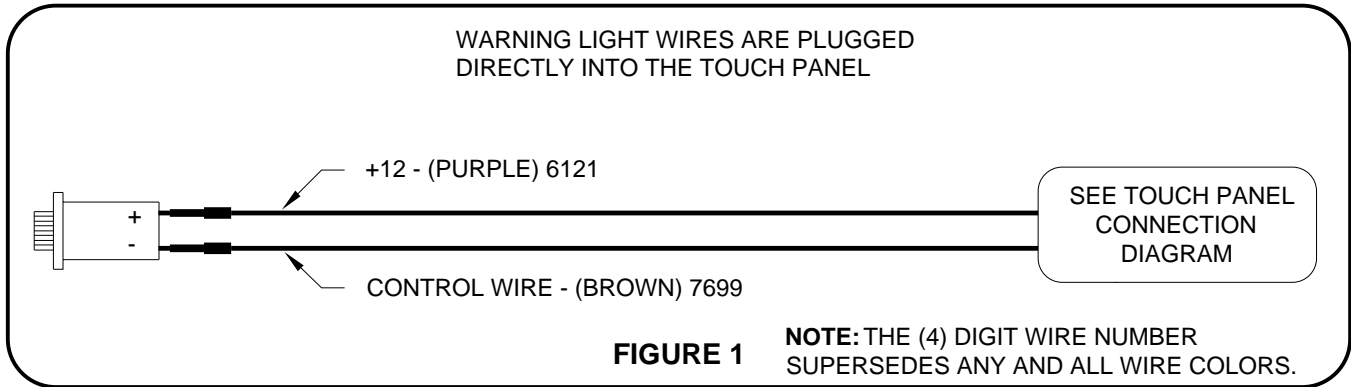
310 SERIES

A MASTER WARNING INDICATOR SHOULD ALWAYS BE USED. WHEN THE LEVELING SYSTEM HAS STRAIGHT-ACTING JACKS A WARNING BUZZER MUST BE USED.

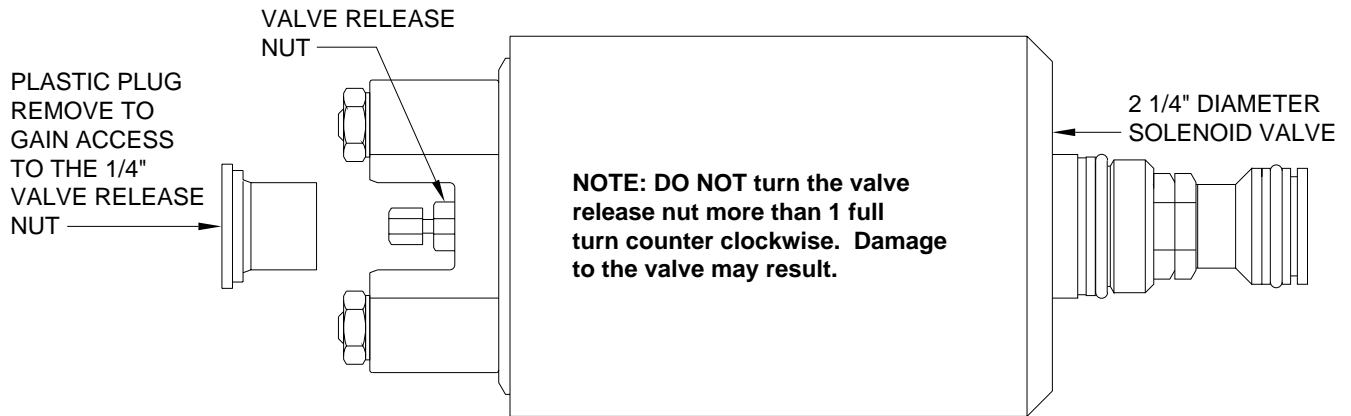
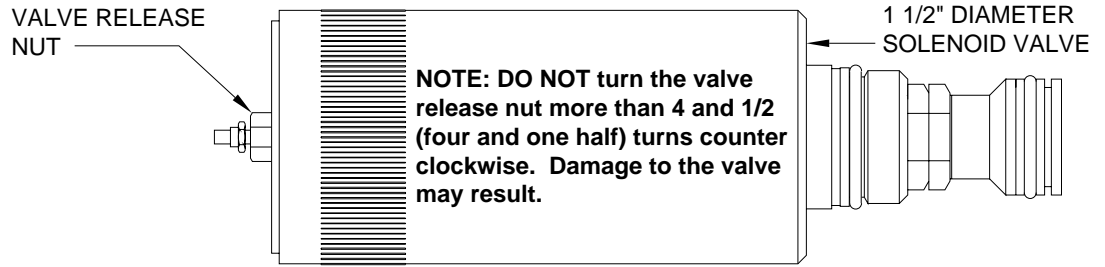
WHEN ONLY A RED MASTER WARNING LIGHT IS USED THE +12 POWER FOR THE LIGHT COMES THROUGH THE TOUCH PANEL. (SEE FIGURE 1 BELOW.) WHEN BOTH A RED LIGHT AND WARNING BUZZER ARE USED THE +12 POWER FOR BOTH INDICATORS IS SUPPLIED BY THE IGNITION SWITCH. THE POWER MUST COME FROM THE "ON" SIDE OF THE IGNITION SWITCH, NOT THE "ACC" SIDE. (SEE FIGURE 2 BELOW.)

NOTE: BY SUPPLYING IGNITION POWER TO THE WARNING BUZZER AND LIGHT, AND "ACC" POWER TO THE CONTROL BOX, THE SYSTEM MAY BE OPERATED IN ACCESSORY WITHOUT THE BUZZER SOUNDING. THE NEGATIVE SIGNAL FOR THE WARNING INDICATORS MUST ALWAYS COME FROM THE TOUCH PANEL.

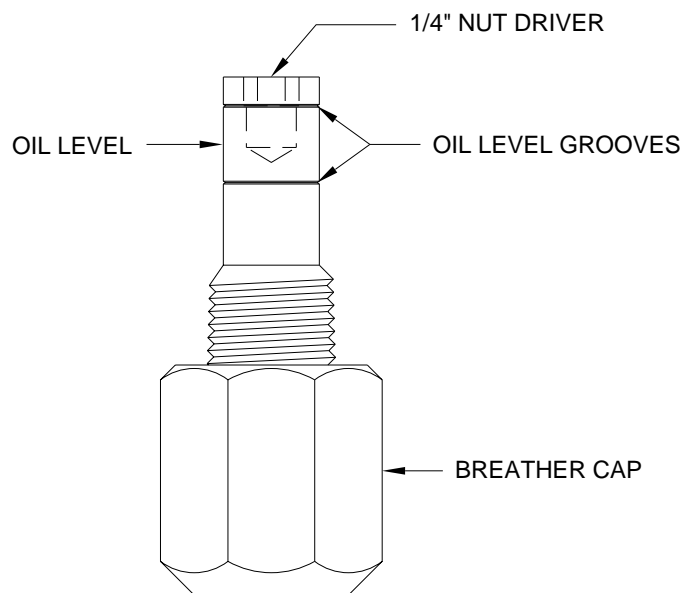
CAUTION: THE PURPLE WIRE IN THE MASTER WARNING LIGHT PIGTAIL IS HOT WHENEVER THE IGNITION IS "ON" OR IN "ACC". THE PURPLE WIRE MUST BE REMOVED FROM THE PIGTAIL WHEN USING DIRECT IGNITION VOLTAGE FOR THE MASTER WARNING INDICATORS.



BREATHER CAP - DIPSTICK - 1/4" NUT DRIVER



NOTE: THE BREATHER CAP IS LOCATED ON THE TOP SIDE OF THE POWER UNIT RESERVOIR.



IMPORTANT: PRIOR TO REMOVING THE BREATHER CAP, EITHER TO CHECK THE OIL LEVEL OR TO USE THE 1/4" NUT DRIVER, CLEAN ANY DEBRIS FROM THE TOP OF THE RESERVOIR. BEFORE RETURNING THE BREATHER CAP TO THE RESERVOIR, REMOVE ANY PAINT CHIPS OR OTHER DEBRIS FROM THE DIPSTICK INCLUDING DEBRIS INSIDE THE 1/4" NUT DRIVER.